

Claims 1-30 (cancelled).

31. (original): A metal complex compound of formula (1a)



wherein Me is manganese, titanium, iron, cobalt, nickel or copper,

X is a coordinating or bridging radical,

n and m are each independently of the other an integer having a value of from 1 to 8,

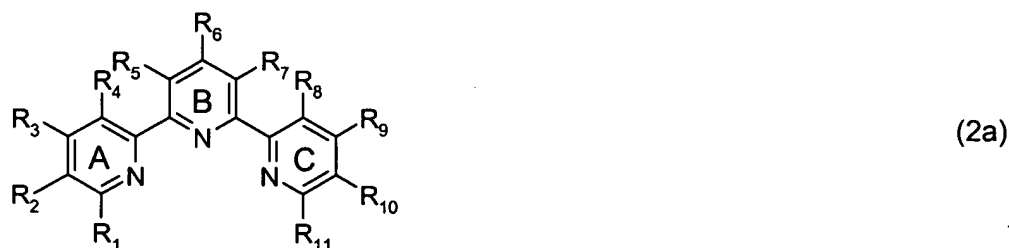
p is an integer having a value from 0 to 32,

z is the charge of the metal complex,

Y is a counter-ion,

q = z/(charge Y), and

L is a ligand of formula (2a)



wherein

R₆ is unsubstituted or substituted C₁-C₁₈alkyl or aryl; cyano; halogen; nitro; -COOR₁₂ or -SO₃R₁₂

wherein R₁₂ is in each case hydrogen, a cation or unsubstituted or substituted C₁-C₁₈alkyl or

aryl; -SR₁₃, -SO₂R₁₃ or -OR₁₃ wherein R₁₃ is in each case hydrogen or unsubstituted or

substituted C₁-C₁₈alkyl or aryl; -NR₁₄R₁₅; -(C₁-C₆alkylene)-NR₁₄R₁₅; -N[⊕]R₁₄R₁₅R₁₆;

-(C₁-C₆alkylene)-N[⊕]R₁₄R₁₅R₁₆; -N(R₁₃)-(C₁-C₆alkylene)-NR₁₄R₁₅; -N[(C₁-C₆alkylene)-NR₁₄R₁₅]₂;

-N(R₁₃)-(C₁-C₆alkylene)-N[⊕]R₁₄R₁₅R₁₆; -N[(C₁-C₆alkylene)-N[⊕]R₁₄R₁₅R₁₆]₂; -N(R₁₃)-N-R₁₄R₁₅ or

-N(R₁₃)-N[⊕]R₁₄R₁₅R₁₆, wherein R₁₃ is as defined above and R₁₄, R₁₅ and R₁₆ are each

independently of the other(s) hydrogen or unsubstituted or substituted C₁-C₁₈alkyl or aryl, or R₁₄

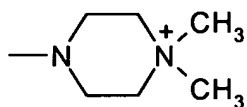
and R₁₅ together with the nitrogen atom bonding them form an unsubstituted or substituted 5-, 6- or 7-membered ring which may optionally contain further heteroatoms; and

R₁, R₂, R₃, R₄, R₅, R₇, R₈, R₉, R₁₀ and R₁₁ are each independently of the others as defined above

for R₆ or are hydrogen or unsubstituted or substituted aryl,

with the proviso that

- (i) at least one of the substituents R_1 - R_{11} contains a quaternized nitrogen atom which is not directly bonded to one of the three pyridine rings A, B or C and that
- (ii) Y is neither I^- nor Cl^- in the case that Me is Mn, R_1 - R_5 and R_7 - R_{11} are hydrogen and R_6 is



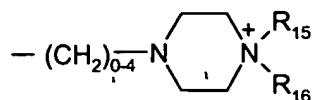
32. (original): A metal complex compound according to claim 31, wherein Me is manganese which is present in oxidation state II, III, IV or V.
33. (original): A metal complex compound according to claim 31, wherein Me is iron which is present in oxidation state II, III or IV.
34. (currently amended): A metal complex compound according to ~~either claim 32 or claim 33,~~ wherein the ligand L is a compound of formula (3)



wherein

R'_6 is cyano; halogen; nitro; $-COOR_{12}$ or $-SO_3R_{12}$ wherein R_{12} is in each case hydrogen, a cation, C_1 - C_{12} alkyl, or phenyl unsubstituted or substituted by C_1 - C_4 alkyl, C_1 - C_4 alkoxy, halogen, cyano, nitro, carboxyl, sulfo, hydroxyl, amino, N-mono- or N,N-di- C_1 - C_4 alkylamino unsubstituted or substituted by hydroxy in the alkyl moiety, N-phenylamino, N-naphthylamino, where the amino groups may be quaternized, phenyl, phenoxy or by naphthoxy; $-SR_{13}$, $-SO_2R_{13}$ or $-OR_{13}$ wherein R_{13} is in each case hydrogen, C_1 - C_{12} alkyl, or phenyl unsubstituted or substituted as indicated above; $-NR_{14}R_{15}$; $-N^{\oplus}R_{14}R_{15}R_{16}$; $-N(R_{13})-(CH_2)_{1-6}NR_{14}R_{15}$; $-N(R_{13})-(CH_2)_{1-6}-N^{\oplus}R_{14}R_{15}R_{16}$; $-N(R_{13})-N-R_{14}R_{15}$ or $-N(R_{13})-N^{\oplus}R_{14}R_{15}R_{16}$, wherein R_{13} is as defined above and R_{14} , R_{15} and R_{16} are each independently of the other(s) hydrogen, unsubstituted or hydroxyl-substituted C_1 - C_{12} alkyl, or phenyl unsubstituted or substituted as indicated above, or R_{14} and R_{15} together with the nitrogen atom bonding them form a pyrrolidine, piperidine, morpholine or azepane ring which is unsubstituted or substituted by at least one unsubstituted C_1 - C_4 alkyl and/or substituted C_1 - C_4 alkyl, wherein the nitrogen atom can be quaternized;

or a radical



wherein R_{15} and R_{16} are as defined above and the ring may be substituted; and R'_3 and R'_9 are as defined above or are hydrogen, C_1 - C_{12} alkyl, or phenyl unsubstituted or substituted as indicated above.

35-42. (cancelled).

43. (currently amended): A washing, cleaning, disinfecting or bleaching agent, comprising

- I) 0 - 50 % A) of an anionic surfactant and/or B) of a non-ionic surfactant,
- II) 0 - 70 % C) of a builder substance,
- III) 1 - 99 % D) of a peroxide, and
- IV) E) a metal complex compound of formula (1) as described in claim 46 in an amount which, in the liquor, gives a concentration of 0.5 – 50 mg/litre of liquor, ~~preferably 1 – 30 mg/litre of liquor,~~ when from 0.5 to 20 g/litre of the washing, cleaning, disinfecting and bleaching agent are added to the liquor,

the percentages in each case being percentages by weight, based on the total weight of the agent.

44-45. (cancelled).

46. (new): A method of catalyzing an oxidation reaction which comprises oxidizing a substrate in the presence of a catalytically effective amount of a metal complex compound of formula (1)



wherein Me is manganese, titanium, iron, cobalt, nickel or copper,

X is a coordinating or bridging radical,

n and m are each independently of the other an integer having a value of from 1 to 8,

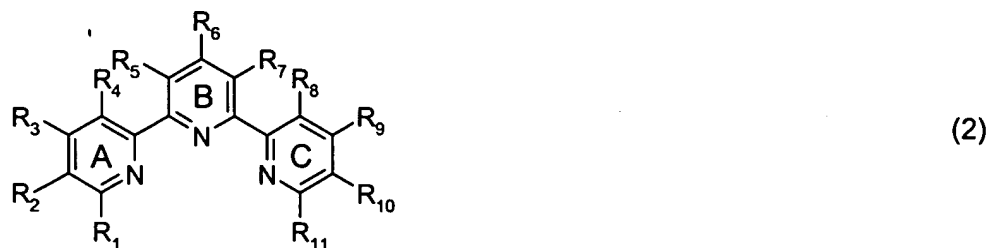
p is an integer having a value of from 0 to 32,

z is the charge of the metal complex,

Y is a counter-ion,

$q = z/(\text{charge } Y)$, and

L is a ligand of formula (2)

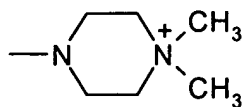


wherein

$R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, R_{10}$ and R_{11} are each independently of the others hydrogen; unsubstituted or substituted C_1 - C_{18} alkyl or aryl; cyano; halogen; nitro; $-COOR_{12}$ or $-SO_3R_{12}$ wherein R_{12} is in each case hydrogen, a cation or unsubstituted or substituted C_1 - C_{18} alkyl or aryl; $-SR_{13}$, $-SO_2R_{13}$ or $-OR_{13}$ wherein R_{13} is in each case hydrogen or unsubstituted or substituted C_1 - C_{18} alkyl or aryl; $-NR_{14}R_{15}$; $-(C_1-C_6\text{alkylene})-NR_{14}R_{15}$; $-N^{\oplus}R_{14}R_{15}R_{16}$; $-(C_1-C_6\text{alkylene})-N^{\oplus}R_{14}R_{15}R_{16}$; $-N(R_{13})-(C_1-C_6\text{alkylene})-NR_{14}R_{15}$; $-N[(C_1-C_6\text{alkylene})-NR_{14}R_{15}]_2$; $-N(R_{13})-(C_1-C_6\text{alkylene})-N^{\oplus}R_{14}R_{15}R_{16}$; $-N[(C_1-C_6\text{alkylene})-N^{\oplus}R_{14}R_{15}R_{16}]_2$; $-N(R_{13})-N-R_{14}R_{15}$ or $-N(R_{13})-N^{\oplus}R_{14}R_{15}R_{16}$, wherein R_{13} is as defined above and R_{14}, R_{15} and R_{16} are each independently of the other(s) hydrogen or unsubstituted or substituted C_1 - C_{18} alkyl or aryl, or R_{14} and R_{15} together with the nitrogen atom bonding them form an unsubstituted or substituted 5-, 6- or 7-membered ring which may optionally contain further heteroatoms;

with the proviso that

- (i) at least one of the substituents R_1 - R_{11} contains a quaternized nitrogen atom which is not directly bonded to one of the three pyridine rings A, B or C and that
- (ii) Y is neither I^- nor Cl^- in the case that Me is Mn(II), R_1 - R_5 and R_7 - R_{11} are hydrogen and R_6 is

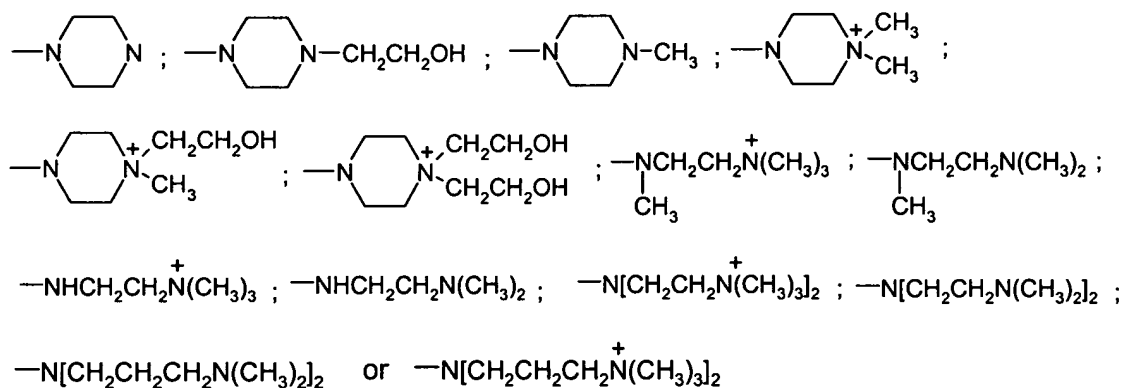


47. (new): A method according to claim 46, wherein Me is manganese which is present in oxidation state II, III, IV or V.

48. (new): A method according to claim 46, wherein Me is iron which is present in oxidation state II, III or IV.
49. (new): A method according to claim 46, wherein X is CH_3CN , H_2O , F^- , Cl^- , Br^- , HOO^- , O_2^{2-} , O^{2-} , $\text{R}_{17}\text{COO}^-$, R_{17}O^- , LMeO^- or LMeOO^- wherein R_{17} is hydrogen, $-\text{SO}_3\text{C}_1\text{-C}_4\text{alkyl}$, or unsubstituted or substituted $\text{C}_1\text{-C}_{18}\text{alkyl}$ or aryl, and L and Me are as defined in claim 46.
50. (new): A method according to claim 46, wherein Y is $\text{R}_{17}\text{COO}^-$, ClO_4^- , BF_4^- , PF_6^- , $\text{R}_{17}\text{SO}_3^-$, $\text{R}_{17}\text{SO}_4^-$, SO_4^{2-} , NO_3^- , F^- , Cl^- , Br^- , I^- , citrate, tartrate or oxalate, wherein R_{17} is hydrogen or unsubstituted or substituted $\text{C}_1\text{-C}_{18}\text{alkyl}$ or aryl.
51. (new): A method according to claim 46, wherein n is an integer having a value of from 1 to 4.
52. (new): A method according to claim 46, wherein m is an integer having a value of 1 or 2.
53. (new): A method according to claim 46, wherein p is an integer having a value of from 0 to 4.
54. (new): A method according to claim 46, wherein z is an integer having a value of from 8- to 8+.
55. (new): A method according to claim 46, wherein aryl is phenyl or naphthyl unsubstituted or substituted by $\text{C}_1\text{-C}_4\text{alkyl}$, $\text{C}_1\text{-C}_4\text{alkoxy}$, halogen, cyano, nitro, carboxyl, sulfo, hydroxyl, amino, N-mono- or N,N-di- $\text{C}_1\text{-C}_4\text{alkylamino}$ unsubstituted or substituted by hydroxy in the alkyl moiety, N-phenylamino, N-naphthylamino, phenyl, phenoxy or by naphthoxy.
56. (new): A method according to claim 46, wherein the 5-, 6- or 7-membered ring formed by R_{14} and R_{15} together with the nitrogen atom bonding them is an unsubstituted or $\text{C}_1\text{-C}_4\text{alkyl}$ -substituted pyrrolidine, piperidine, piperazine, morpholine or azepane ring, wherein the nitrogen atoms can optionally be quaternized.
57. (new): A method according to claim 46, wherein R_6 is $\text{C}_1\text{-C}_{12}\text{alkyl}$; phenyl unsubstituted or substituted by $\text{C}_1\text{-C}_4\text{alkyl}$, $\text{C}_1\text{-C}_4\text{alkoxy}$, halogen, cyano, nitro, carboxyl, sulfo, hydroxyl, amino, N-mono- or N,N-di- $\text{C}_1\text{-C}_4\text{alkylamino}$ unsubstituted or substituted by hydroxy in the alkyl moiety, N-phenylamino, N-naphthylamino, phenyl, phenoxy or naphthoxy; cyano; halogen; nitro; $-\text{COOR}_{12}$ or $-\text{SO}_3\text{R}_{12}$ wherein R_{12} is in each case hydrogen, a cation, $\text{C}_1\text{-C}_{12}\text{alkyl}$, or phenyl

unsubstituted or substituted as indicated above; $-\text{SR}_{13}$, $-\text{SO}_2\text{R}_{13}$ or $-\text{OR}_{13}$ wherein R_{13} is in each case hydrogen, $\text{C}_1\text{-C}_{12}$ alkyl, or phenyl unsubstituted or substituted as indicated above; $-\text{NR}_{14}\text{R}_{15}$; $-(\text{C}_1\text{-C}_6\text{alkylene})\text{-NR}_{14}\text{R}_{15}$; $-\text{N}^{\oplus}\text{R}_{14}\text{R}_{15}\text{R}_{16}$; $-(\text{C}_1\text{-C}_6\text{alkylene})\text{-N}^{\oplus}\text{R}_{14}\text{R}_{15}\text{R}_{16}$; $-\text{N}(\text{R}_{13})\text{-(C}_1\text{-C}_6\text{alkylene})\text{-NR}_{14}\text{R}_{15}$; $-\text{N}(\text{R}_{13})\text{-(C}_1\text{-C}_6\text{alkylene})\text{-N}^{\oplus}\text{R}_{14}\text{R}_{15}\text{R}_{16}$; $-\text{N}(\text{R}_{13})\text{-N-R}_{14}\text{R}_{15}$ or $-\text{N}(\text{R}_{13})\text{-N}^{\oplus}\text{R}_{14}\text{R}_{15}\text{R}_{16}$, wherein R_{13} can have one of the above meanings and R_{14} , R_{15} and R_{16} are each independently of the other(s) hydrogen, unsubstituted or hydroxyl-substituted $\text{C}_1\text{-C}_{12}$ alkyl, or phenyl unsubstituted or substituted as indicated above, or R_{14} and R_{15} together with the nitrogen atom bonding them form a pyrrolidine, piperidine, piperazine, morpholine or azepane ring which is unsubstituted or substituted by at least one unsubstituted $\text{C}_1\text{-C}_4$ alkyl and/or substituted $\text{C}_1\text{-C}_4$ alkyl, wherein the nitrogen atom can be quaternized, and R_1 , R_2 , R_3 , R_4 , R_5 , R_7 , R_8 , R_9 , R_{10} and R_{11} are as defined in claim 46 or are hydrogen.

58. (new): A method according to claim 57, wherein R_6 is



and

R_1 , R_2 , R_3 , R_4 , R_5 , R_7 , R_8 , R_9 , R_{10} and R_{11} are as defined above or are hydrogen.

59. (new): A method according to claim 57, wherein the ligand L is a compound of formula

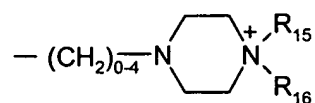


wherein

R'_3 , R'_6 and R'_9 are as defined for R_6 in claim 57, wherein R'_3 and R'_9 can additionally be hydrogen.

60. (new): A method according to claim 59, wherein

R'₃, R'₆ and R'₉ are each independently of the others phenyl unsubstituted or substituted by C₁-C₄alkyl, C₁-C₄alkoxy, halogen, phenyl or hydroxyl; cyano; nitro; -COOR₁₂ or -SO₃R₁₂, wherein R₁₂ is in each case hydrogen, a cation, C₁-C₄alkyl or phenyl; -SR₁₃, -SO₂R₁₃ or -OR₁₃ wherein R₁₃ is in each case hydrogen, C₁-C₄alkyl or phenyl, -N(CH₃)-NH₂ or -NH-NH₂; amino; N-mono- or N,N-di-C₁-C₄alkylamino unsubstituted or substituted by hydroxy in the alkyl moiety, wherein the nitrogen atoms which are not bonded to one of the three pyridine rings A, B or C, may be quaternized; N-mono- or N,N-di-C₁-C₄alkyl-N[⊕]R₁₄R₁₅R₁₆, unsubstituted or substituted by hydroxy in the alkyl moiety, wherein R₁₄, R₁₅ and R₁₆ are each independently of the others hydrogen, unsubstituted or hydroxyl-substituted C₁-C₁₂alkyl, or phenyl unsubstituted or substituted as indicated above, or R₁₄ and R₁₅ together with the nitrogen atom bonding them form a pyrrolidine, piperidine, morpholine or azepane ring unsubstituted or substituted by at least one C₁-C₄alkyl or by at least one unsubstituted C₁-C₄alkyl and/or substituted C₁-C₄alkyl wherein the nitrogen atom can be quaternized; N-mono- or N,N-di-C₁-C₄alkyl-NR₁₄R₁₅ unsubstituted or substituted by hydroxy in the alkyl moiety, wherein R₁₄ and R₁₅ can have the meanings indicated above; or a radical



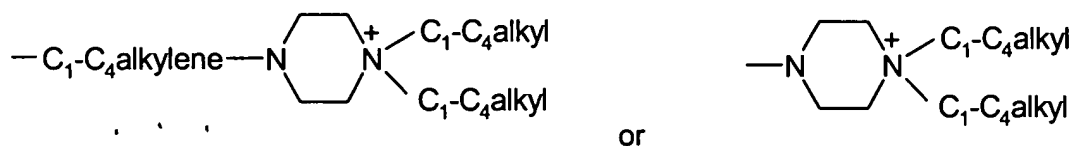
wherein R₁₅ and R₁₆ have the meanings indicated above, and the ring may be substituted, where R'₃ and R'₉ can likewise be hydrogen.

61. (new): A method according to claim 59, wherein R₆ is hydroxy.

62. (new): A method according to claim 46, wherein at least one of the substituents R₁-R₁₁ is one of the radicals -(C₁-C₆alkylene)-N[⊕]R₁₄R₁₅R₁₆; -N(R₁₃)-(C₁-C₆alkylene)-N[⊕]R₁₄R₁₅R₁₆; -N[(C₁-C₆alkylene)-N[⊕]R₁₄R₁₅R₁₆]₂; or -N(R₁₃)-N[⊕]R₁₄R₁₅R₁₆, wherein R₁₃ is in each case hydrogen, C₁-C₄alkyl or phenyl and R₁₄, R₁₅ and R₁₆ are each independently of the others hydrogen or substituted or unsubstituted C₁-C₁₈alkyl or aryl, or R₁₄ and R₁₅ together with the nitrogen atom bonding them form a substituted or unsubstituted 5-, 6- or 7-membered ring which may contain further heteroatoms; or -NR₁₄R₁₅; -(C₁-C₆alkylene)-NR₁₄R₁₅; -N(R₁₃)-(C₁-C₆alkylene)-NR₁₄R₁₅; -N[(C₁-C₆alkylene)-NR₁₄R₁₅]₂; or -N(R₁₃)-N-R₁₄R₁₅, wherein R₁₃ and R₁₆ are as defined above and R₁₄ and R₁₅ together with the nitrogen atom bonding them form a 5-, 6- or 7-membered ring which is unsubstituted or substituted by at least one

unsubstituted C₁-C₄alkyl and/or substituted C₁-C₄alkyl and may contain further heteroatoms, wherein at least one nitrogen atom which is not bonded to one of the pyridine rings A, B or C is quaternized.

63. (new): A method according to claim 59, wherein at least one of the substituents R'₃, R'₆ and R'₉ is one of the radicals -(C₁-C₆alkylene)-N[⊕]R₁₄R₁₅R₁₆; -N(R₁₃)-(C₁-C₆alkylene)-N[⊕]R₁₄R₁₅R₁₆; -N[(C₁-C₆alkylene)-N[⊕]R₁₄R₁₅R₁₆]₂; or -N(R₁₃)-N[⊕]R₁₄R₁₅R₁₆, wherein R₁₃ is in each case hydrogen, C₁-C₄alkyl or phenyl and R₁₄, R₁₅ and R₁₆ are each independently of the others hydrogen or substituted or unsubstituted C₁-C₁₈alkyl or aryl, or R₁₄ and R₁₅ together with the nitrogen atom bonding them form a substituted or unsubstituted 5-, 6- or 7-membered ring which may contain further heteroatoms; or -NR₁₄R₁₅; -(C₁-C₆alkylene)-NR₁₄R₁₅; -N(R₁₃)-(C₁-C₆alkylene)-NR₁₄R₁₅; -N[(C₁-C₆alkylene)-NR₁₄R₁₅]₂; or -N(R₁₃)-N-R₁₄R₁₅, wherein R₁₃ and R₁₆ are as defined above and R₁₄ and R₁₅ together with the nitrogen atom bonding them form a 5-, 6- or 7-membered ring which is unsubstituted or substituted by at least one unsubstituted C₁-C₄alkyl and/or substituted C₁-C₄alkyl and may contain further heteroatoms, wherein at least one nitrogen atom which is not bonded to one of the pyridine rings A, B or C is quaternized.
64. (new): A method according to claim 46, wherein at least one of the substituents R₁-R₁₁ is one of the radicals -(C₁-C₄alkylene)-N[⊕]R₁₄R₁₅R₁₆; -N(R₁₃)-(C₁-C₆alkylene)-N[⊕]R₁₄R₁₅R₁₆; -N[(C₁-C₆alkylene)-N[⊕]R₁₄R₁₅R₁₆]₂; or -N(R₁₃)-N[⊕]R₁₄R₁₅R₁₆, wherein R₁₃ is as defined in claim 46 and R₁₄, R₁₅ and R₁₆ are each independently of the others hydrogen or substituted or unsubstituted C₁-C₁₂alkyl or aryl, or R₁₄ and R₁₅ together with the nitrogen atom bonding them form a 5-, 6- or 7-membered ring which may be unsubstituted or substituted by at least one unsubstituted C₁-C₄alkyl and/or substituted C₁-C₄alkyl and may contain further heteroatoms; or -NR₁₄R₁₅; -(C₁-C₆alkylene)-NR₁₄R₁₅; -N(R₁₃)-(C₁-C₆alkylene)-NR₁₄R₁₅; -N[(C₁-C₆alkylene)-NR₁₄R₁₅]₂; or -N(R₁₃)-N-R₁₄R₁₅, wherein R₁₃ and R₁₆ are as defined above and R₁₄ and R₁₅ together with the nitrogen atom bonding them form a substituted or unsubstituted 5-, 6- or 7-membered ring which may contain further heteroatoms, wherein the nitrogen atom which is not bonded to one of the pyridine rings A, B or C is quaternized.
65. (new): A method according to claim 64, wherein at least one of the substituents R₁-R₁₁ is one of the radicals



wherein the alkylene group is unbranched or branched and may be substituted, and wherein the alkyl groups are independently unbranched or branched and may be substituted and wherein the piperazine ring may be substituted.

66. (new): A method according to claim 46, wherein a metal complex compound of formula (1) is used in a washing, cleaning, disinfecting or bleaching agent.
67. (new): A method according to claim 66, wherein a metal complex compound of formula (1) is formed *in situ* in the washing, cleaning, disinfecting or bleaching agent.
68. (new): A method according to claim 46, wherein a metal complex compound of formula (1) is used together with a peroxy compound for the bleaching of spots or stains on textile material or for the prevention of the redeposition of migrating dyes in the context of a washing process or for the cleaning of hard surfaces.
69. (new): A method according to claim 46, wherein a metal complex compound of formula (1) is used as a catalyst for reactions with a peroxy compound for bleaching in the context of paper-making.
70. (new): A method according to claim 46, wherein a metal complex compound of formula (1) is used as a catalyst for wastewater treatment.
- 71 (new): A method according to claim 46, wherein a metal complex compound of formula (1) is used as a catalyst for the delignification of cellulose.
72. (new): A method according to claim 46, wherein mixtures of manganese complexes of the formula (1) with iron complexes of the formula (1) are used for preventing the redeposition of migrating dyes and at the same time bleaching of spots or stains on textile material.

73. (new): A method according to claim 74, wherein mixtures of manganese complexes of the formula (1) with iron complexes of the formula (1'), which corresponds to the formula (1) but contains no quaternized nitrogen atoms, are used.